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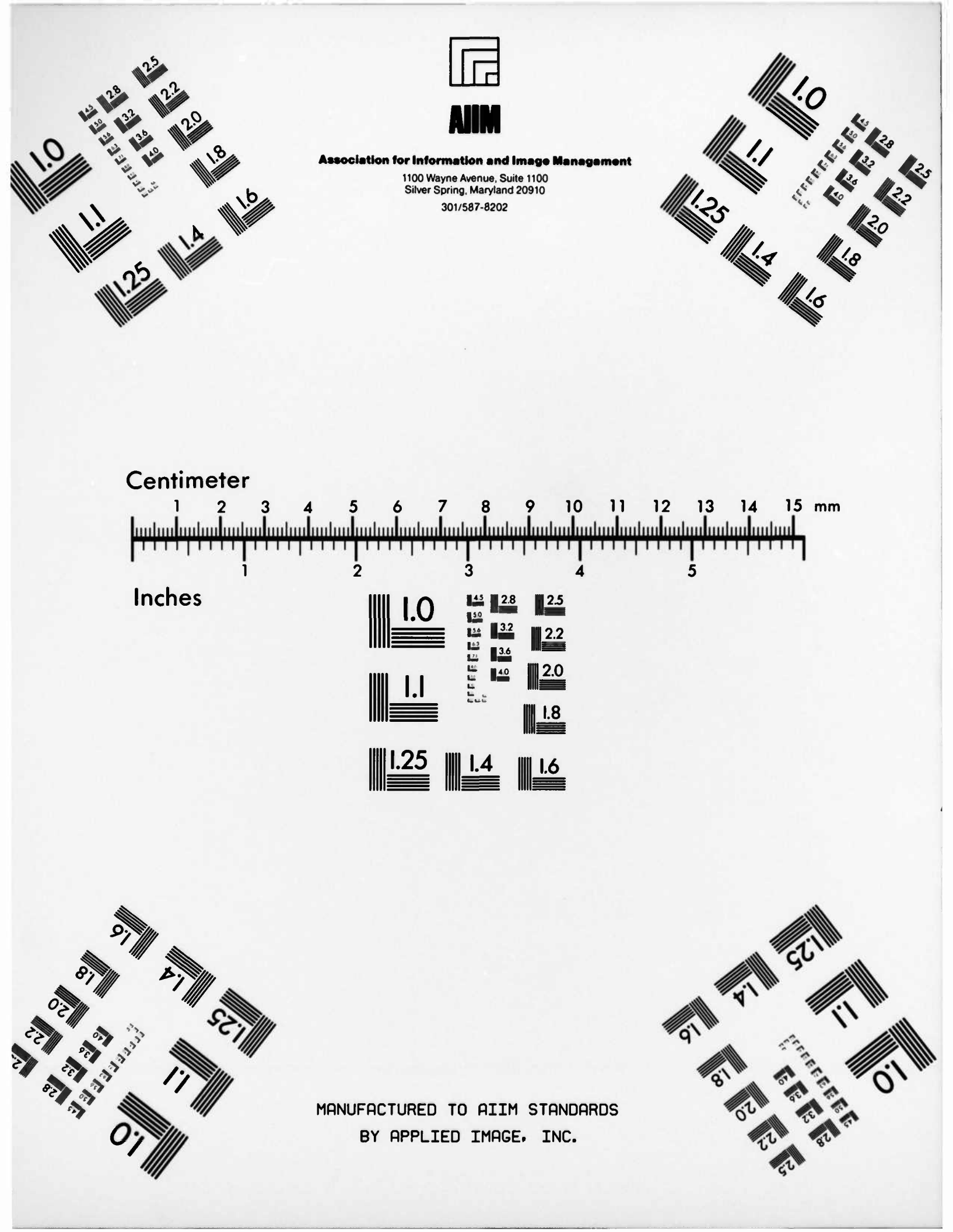
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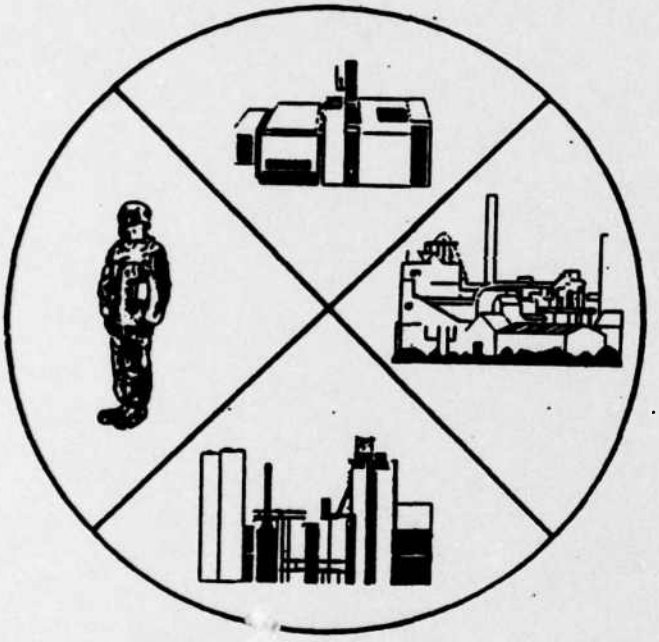
(EAI Report 85/90/003F)

COMPLIANCE MONITORING FOR THE CHEMICAL WEAPONS (CW) CONVENTION

PRELIMINARY OPERATIONAL CONCEPTS



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13. ABSTRACT *(Maximum 200 words)*

The U.S. has established a position supporting a verifiable worldwide ban on the use, stockpiling, and production of chemical weapons. A research program for compliance monitoring was authorized and appropriated as part of the FY 90 Department of Defense funding. Overall management of this program is being provided by the Defense Nuclear Agency with the U.S. Army Chemical research, Development and Engineering Center (CRDEC) as a major support agency. CRDEC has developed a program to evaluate compliance monitoring methods in support of verification inspections provisions in the draft Convention. This report documents the first step of the CRDEC program, which is to develop preliminary operational concepts for conduction verification inspections.

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PREFACE

The work described in this report was sponsored by the Defense Nuclear Agency under Project No. TA, Task No. TC, and Work Unit No. 00001 and authorized under Contract No. DAAA15-87-D-0021, Technical/Administration Mission Support, Task 85, CWC Compliance Monitoring Field Walk-Throughs/Demonstrations. This work was started in June 1990 and will be completed in August 1991. This report is in accordance with ELINA077. The U.S. Army Chemical Research, Development and Engineering Center publication date, indicated on the cover and SF 298 for this report, has been backdated to coincide with the original contractor publication date.

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- CRDEC
- Brookhaven National Laboratory
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- Pacific Northwest Laboratories/Battelle
- Sandia National Laboratories

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COMPLIANCE MONITORING
FOR THE CHEMICAL WEAPONS (CW) CONVENTION

Preliminary Operational Concepts

1. INTRODUCTION

1.1 BACKGROUND

The United States has established a position supporting a verifiable worldwide ban on the use, stockpiling, and production of chemical weapons (CW). This position was established initially through the 40-nation Conference on Disarmament. More recently, the U.S. position was presented during the concurrent bilateral negotiations between the U.S. and the U.S.S.R.

In 1984, the U.S. took its first step toward establishing a framework for the Chemical Weapons Convention (CWC) through the introduction of a draft treaty proposal by then-Vice President Bush. Since its introduction, this document has served as the baseline from which subsequent versions of the CWC "Rolling Text" have evolved. Negotiations are continuing to finalize the rolling text.

A "Research Program for Compliance Monitoring of a Chemical Weapons Convention" was authorized and funding appropriated as part of the FY 1990 Department of Defense (DOD) budget. Overall management for this program is being provided by the Defense Nuclear Agency (DNA) as Executive Agent for verification R&D for all treaties. The focus of the R&D program is three-fold:

- Immediate support of U.S. negotiators in determining risk and potential for near-term entry into force of the CWC.
- Continuing need during the life of the CWC for verification equipment.
- On-going R&D to update verification procedures and equipment.

1.2 CRDEC ROLE

The U.S. Army Chemical Research, Development and Engineering Center (CRDEC) has been selected as the primary agency to accomplish the hardware aspects of the R&D program. Initially, the emphasis of the CRDEC program in compliance monitoring is to develop operational procedures using available ("off-the-shelf") equipment to support CWC verification. Specifically, CRDEC has been tasked in three areas:

- Assessment of sensor, sampling, and protective equipment.

- Sampling methodology and chain-of-custody controls.

- Field demonstration of available technology.

1.3 CRDEC APPROACH

In the execution of the effort in these task areas, CRDEC has developed a program that builds on CRDEC's established chemical warfare related expertise, and integrates the on-going R&D of the National Laboratories, Other Government Agencies (OGA) expertise in chemical warfare and treaty verification, and contractor support.

The three tasks assigned to CRDEC are inter-related, with the third task to conduct field demonstrations of available technology being the focal point of the program. Figure 1 is a schematic presentation of the CRDEC approach to the technical assessment of equipment recommended by the first two tasks and the field demonstration of inspection technology.

The first step in the approach is to develop operational concepts for verification inspections. These operational concepts depend on what is being inspected and the aim of the inspection. The CWC rolling text specifies requirements for declarations of CW stockpiles, CW production facilities and permitted commercial production of CW agents and key precursors. It also specifies verification aims relative to the declarations.

An operational concept is defined as the "how" used by an inspection team to accomplish the aims of verification inspections. It includes the inspection functions required (e.g., CW identification and CW quantification) and the methods chosen to accomplish these functions. Each method can involve a series of steps where each step requires equipment and/or people to accomplish the step. The people and/or equipment will need defined operational procedures to accomplish the step.

Each step represents a sub-function which can be achieved with various combinations of equipment, people, and procedures. Some combinations may use highly sophisticated equipment which requires a high level of training to perform the required procedures. Other combinations may use simple equipment with very little personnel training required to perform the required procedures.

Figure 2 illustrates the hierarchical structure required to define the "how" for an operational concept. The various terms such as step and procedure usually have broad meaning. The usage of these terms in this structure are much narrower. Examples are included along with each hierarchal term.

The inspection functions required are fixed depending on the particular verification aim (e.g., CW identification in support of an aim to confirm the